FAULT PROTECTION FOR HITLESS AND ERRORLESS SWITCHING OF TELECOMMUNICATIONS SIGNALS

ABSTRACT OF THE DISCLOSURE

In a distributed switch architecture, each incoming signal is sliced into a plurality of sub-signals. A checksum function is applied to subsets of data in each sub-signal to generate and add a checkbit to the sub-signal for each subset of data. Two copies of the augmented sub-signal are routed in parallel through redundant portions of the distributed switch fabric. Only one of the resulting routed sub-signals is selected for use in generating the corresponding outgoing signal, which is generated by combining data from selected routed sub-signals corresponding to all of the original sub-signals. Checksum analysis is performed on the two routed sub-signals to determine if a fault has occurred. If a fault is detected in the routed sub-signal currently being selected for use in generating the outgoing signal, the selection is changed so that the other routed sub-signal is used. The checkbits are preferably added to the sub-signals in place of terminated overhead data in the transmission format of the incoming signal. By appropriate selection of the size of each subset of data (i.e., if the size is not too small), the number of checkbits added to the sub-signals will not increase the size of the data routed through the distributed switch fabric relative to the size of the data in the transmission format of the incoming signal. In addition, an appropriate selection of the size of each subset of data (i.e., if the size is not too big) ensures that the fault protection scheme of the present invention will satisfy requirements for errorless switching in which the total detection time from a single-point failure is kept within 60 nanosec.